8 Communication and Monitoring

8.1 Communication Interface

Standard configuration:
1. Ethernet: Transmit the inverter working state such as output voltage, current, frequency, fault information to the PC machine or other monitoring system. Ethernet can achieve multi-inverter wired network at the same time.

Optional configuration:
WIFI: Wireless connect to route. Transmit the inverter working state such as output voltage, current, frequency, fault information to the PC machine or other monitoring system. WIFI can achieve multi-inverter wireless network at the same time.
RS485: Achieve multi-inverter network to monitor the inverter working state such as output voltage, current, frequency, fault information

GPRS: Inform message by message.

Only choose one optional configuration when inverter is working.

8.2 Communication mode

When user want to know the information of the power system and monitor power system. We offer following communications.

8.2.1 Ethernet communication

You can connect inverter to Internet by router (the router is not special for inverters, you can get any brand in the market). Then you can see the inverter's data in any place of the world.

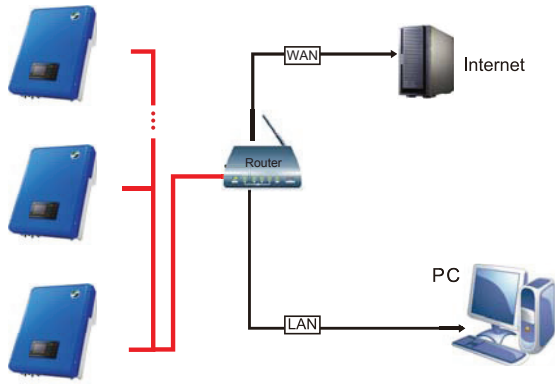


Figure 22 Ethernet communication

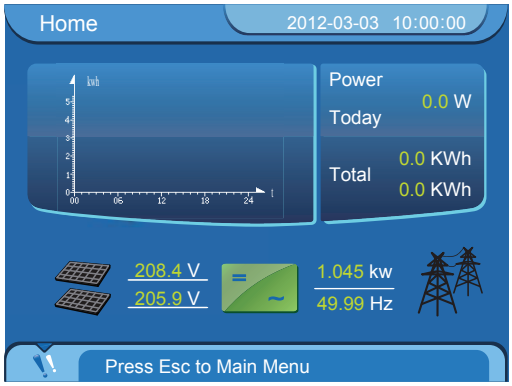
Hardware Requirements: computer which support windows(including xp,vista,win7), router, netting twine, inverter(LAN mode).

Monitor mode: LAN and WAN.
LAN: Install SolarPower Browser in PC which can monitor inverters .In this mode, you can use a router or nonuse.

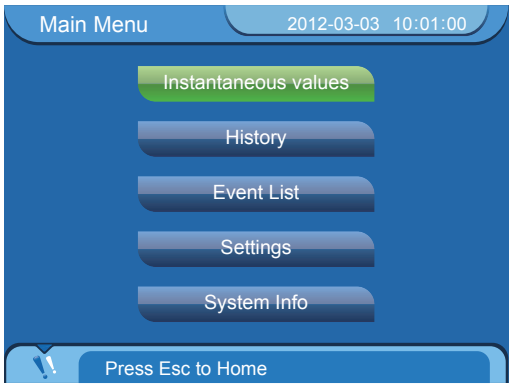
If you use a router, you can monitor 254 inverters.

Parameter setting when using router:

Step 1：Enter home interface automatically after startup (If not the home interface, press "ESC" return to the home interface).



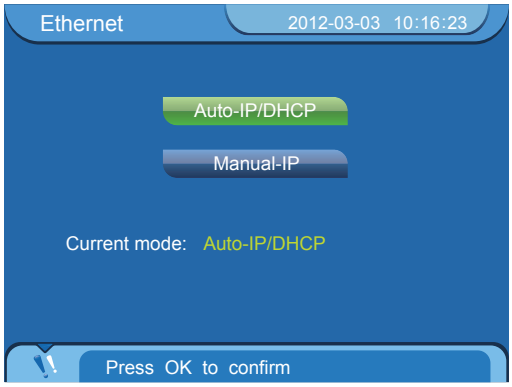
Step 2: Press "ESC" in home interface then enter the main menu.



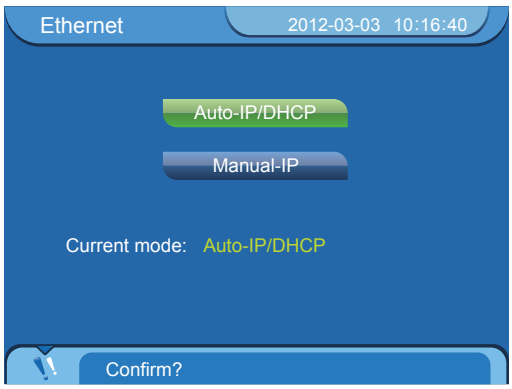
Step 3: Move the cursor to "settings" and then press "OK", will enter settings interface.

Step 4: Move the cursor to "network", press "OK" and then enter "Input Password" interface.

Step 5: Press "right" or "left" key to move the cursor to select the figure which need to be modified. Press "up" or "down" key to modify figure. If the password is correct will enter 'Ethernet" interface.

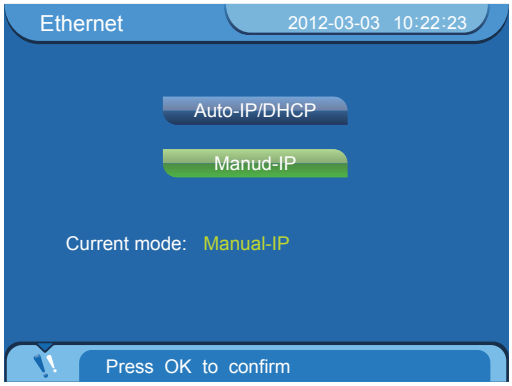


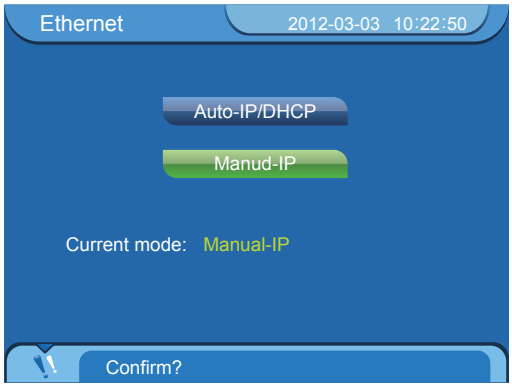
Step 6: Move the cursor to "Auto-IP/DHCP", press "OK" twice. LCD interface will Reboot and then enter into home interface automatically.



If you don’t use a router, you can only monitor 1 inverter. Need to use cable to connect inverter with PC.

Parameter setting when not using router:
Refer to settings when using router:Main Menu->Settings->Network->Ethernet. In "Ethernet" interface move the cursor to "Manual-IP", press "OK" twice(one press to confirm).





Press "OK" twice then will enter "Manual-IP" interface. Press "right" or "left" key to move the cursor to select the figure which need to be modified. Press "up" or "down" key to modify figure(IP Address: 192.168.000.002. Subnet Mask: 255.255.255.000, others are 0). Press "OK" after modifying. LCD will display the setting parameter and press "OK" again, now setting is over. LCD interface will Reboot and then enter to home interface automatically.

Parameter set for PC:
Set IP address as 192.168.000.001,
Set Subnet mask as 255.255.255.000.

① Need to install SolarRiver-D inverter monitoring software in the PC when using WIFI, Ethernet communication.
② Can't using RS485 and Ethernet communication mode for a PC at the same time.
③ The default set is "Auto IP". If use router, LAN or WAN monitor is available without any parameter setting.
④ In WAN mode, must use router and recommend to select auto IP mode.

8.2.2 RS485 Communication

RS485 is generally for at most 32 inverters communication at the same time. But the length of communication wire should be≤1200m. You can read and analyse data by PC if the system is equipped with Solar-Log200/500/1000. Please refer to Solar-Log200/500/1000 manual for more information.

Figure 23 RS-485 jack

Two types of cable must be prepared before using Solar-Log to monitor mult-inverters.

The communication cable between inverter and inverter:

1. Prepare two 8-PIN RJ45 modular plug, hold the RJ45 modular plug with the 'clip' on the bottom, the 'opening' (where you insert the cable) facing you, the order number is 1 to 8 from left to right, as figure 24.

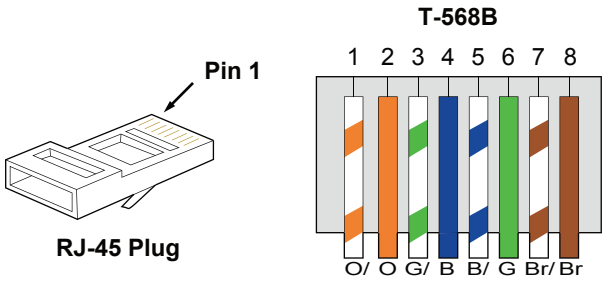


Figure 24

2. Use a length of communication cable, then push the 8 color wires into the modular plug follow the same order as below.

1	orange white
2	orange
3	green white
4	blue
5	blue white
6	green
7	brown white
8	brown

3. Then put the both ends of communication cable into the communication ports of inverter respectively. If there are N inverters, need N-1 this communication cable.

The communication cable between inverter and Solar-Log:

1. One side of cable is the same as cable between inverter and inverter, the other side remains 4 colour wires: green white, green, orange white, orange, as shown in figure 25.

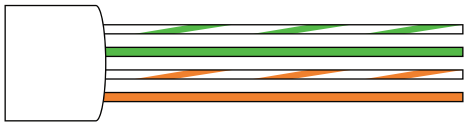


Figure 25

2. Connect 4 colour wires to 1,4,5,6 port of Solar-Log.

1	green white
2	reserve
3	reserve
4	green
5	orange white
6	orange

8.2.3 WIFI communication

You can connect inverter to Internet by router. Then you can see the inverter's data in any place where internet is available.

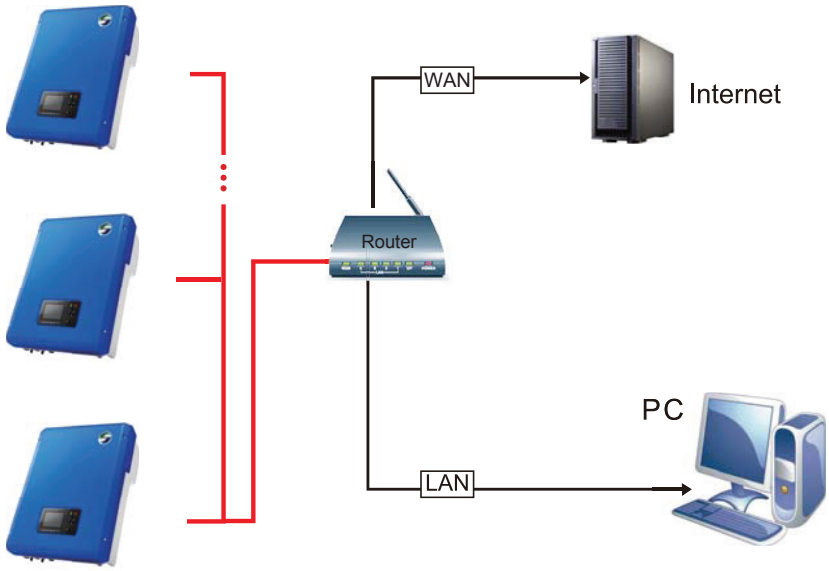


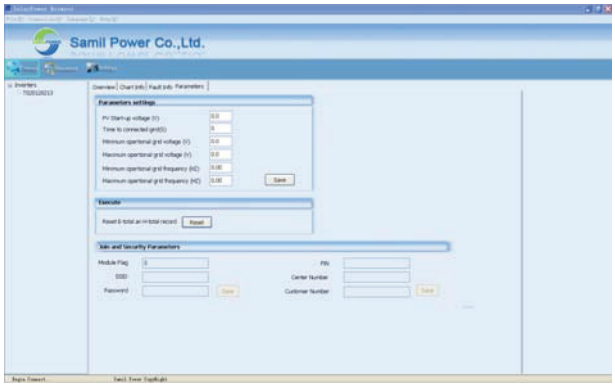
Figure 26 WIFI communication

OS: win xp, Vista, Win7;
Network: Lan or Wan;
Wifi: 802.11g.

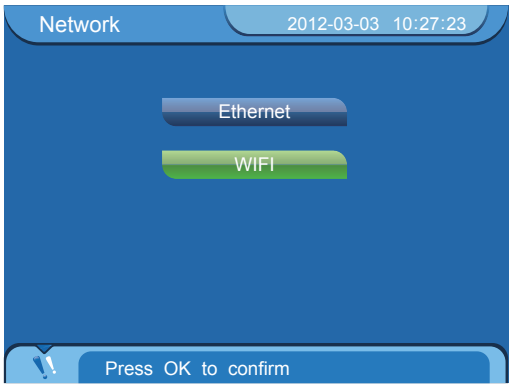
WIFI settings:
Note：Appendix is WIFI route list.

Step1: Connect a cable following the steps of Ethernet before opening "SolarPower Browser".

Step2: Double-click name of inverter to enter detail information page. Set the SSID of router which WIFI is going to be connected to and input the password(known from installation contractor) then save these information.



Step3：Reboot the computer automatically and disconnect netting twine connection.
Step4：Check WIFI information:
Enter the interface successively: Main Menu->Settings->Network, move the cursor to "WIFI" and press "OK".



The GUI bellow tells the WIFI hasn't been set yet.

If WIFI has been set, shown as following figure.

Hardware Requirements: router、inverter equipped with WIFI、PC（with SolarPower Browser software）

8.2.4 GPRS communication

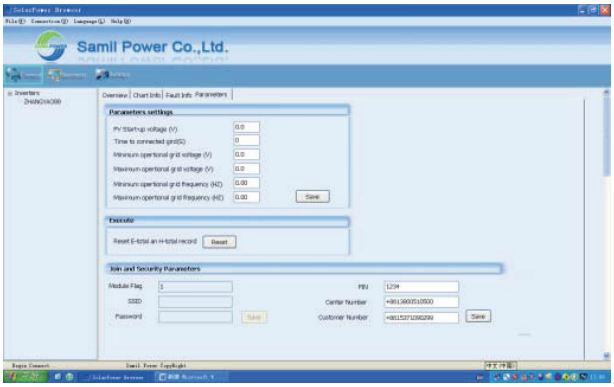
GPRS function is that sends fault message to user when inverter is at fault.
Hardware Requirements: SIM card, inverter equipped with GPRS, mobile telephone.
Monitor mode: message.

GPRS settings:

Step1: Use mobile telephone to set PIN code of SIM card which will be installed in inverter.

Step2: Connect cable following the steps of Ethernet before opening "SolarPower Browser".

Step3: Double-click name of inverter then enter detail information interface. Set the PIN code, service center number and customer mobile telephone number then save these information.

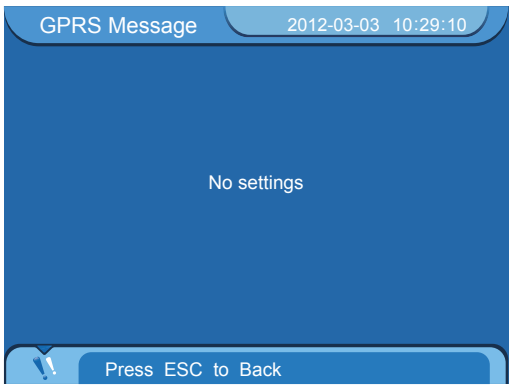


Step4: Reboot the computer automatically.

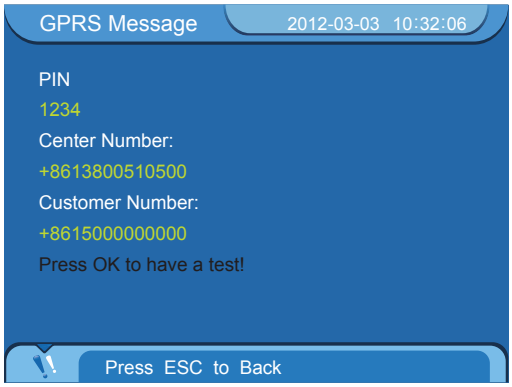
Step5: Check GPRS information:

Enter the interface successively: Main Menu->Settings->Network, move the cursor to "GPRS" and press "OK".

If GPRS setting has not been initialised, shown as following figure.



If GPRS setting has been initialised, press "OK" to check the information, shown as following figure.



9 Troubleshooting and maintenance

9.1 Troubleshooting

This section illustrates possible faults of an inverter and solving methods and provides users with troubleshooting tips to help them identify and solve common problems. Please read the following troubleshooting steps:

1. Check the warning, fault messages or fault codes displayed on LCD. If a message is displayed, record it before doing anything further.
2. Attempt the solution according to table 5.
3. If no fault message is displayed on LCD, check the following list whether the installation meet the requirements.

— Is the inverter installed in a clean, dry, adequately ventilated place?
— Have the DC input switch been opened?
— Do section area and length of cable meet requirements?
— Are the input and output connections and wiring in good condition?
— Are the configuration settings correct for user particular installation?

Steps of checking the warning and fault information displayed on LCD:
Move the cursor to the "Event list" and then press "OK" in main menu interface, then enter "Event list" interface.

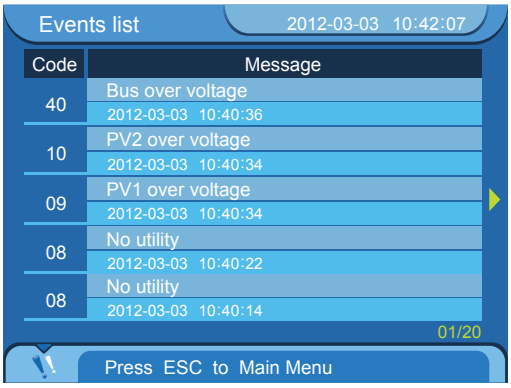


Figure 27 Event list interface

When SolarRiver-D inverter is at fault, the fault information is composed of code, occurring time and fault description.
Please contact Samil Power Co.,Ltd for further technical assistance. Please provide detailed installation information and inverter model, serial number and fault information.

Table 5 Troubleshooting list

Faults	Diagnosis and Solutions
Grid volt / freq over / underrating	-Wait grid go back to normal working state. -Mak sure that grid voltage and frequency complies with standards. -Or, please ask for help
No Utility	-Check grid-connection -Or, please ask for help.
PV1/PV2 over voltage	-Check the PV open-circuit voltage whether it is >Max.DC voltage. -Or, please ask for help.
DCI out range	- Wait for one minute. -Or, please ask for help.
SCI/ SPI communication fault	-Disconnect DC and AC side, and connect them again. -Or, please ask for help.
PV1/PV2 isolation fault	-Check the impedance among PV (+)、PV (-) and grounding whether they are>600Kohm. -Or, please ask for help.
Consistent Fault	-Disconnect DC and AC side, and connect them again. -Or, please ask for help.
Relay Failure	-Disconnect DC and AC side, and connect them again. -Or, please ask for help.
GFCI over 30mA /60mA / 150mA /300mA fault	-Check whether leakage current is too high. -Disconnect DC and AC side, check the surrounding equipment on the AC side. -Reconnect the input side and check inverter after troubleshooting. -Or, please ask for help.
EEPROM read/ write failure	-Disconnect DC and AC side, and connect them again. -Or, please ask for help.
Bus over voltage	-Disconnect DC side, and connect them again. -Check L line and N line whether it has connection faults. -Or, please ask for help.
GFCI device failure	-Disconnect DC and AC side, and connect them again. -Or, please ask for help.
Input/ output current high	-Disconnect DC and AC side, and connect them again. -Or, please ask for help.

9.2 Daily maintenance

Inverters generally do not need any maintenance or calibration, but ensure air-cooling fin not be covered by any dust or dirties.

- Inverter cleaning
  Please use electric drier, soft dry cloth or brush to clean inverters. Water, corrosive chemical substance or intense cleaning agent are not allowed to clean the inverter.

- Cooling fin cleaning
  To ensure inverter good performance and long-period usage, cooling fin needs to be left with adequate space. Please use electric drier, soft cloth or brush to clean cooling fin. Water, corrosive chemical substance or intense cleaning agent is not allowed.

10 Decommissioning

10.1 Decommissioning steps

1. Switch off the AC grid;
2. Switch Off the DC switch;
3. Wait 5 minutes;
4. Release the DC connectors;
5. Release the AC connectors.

Now inverters can be demounted safely.

10.2 Package

Please pack the inverter with the original package as far as possible. If original package is not available, use an equivalent carton that meets the following requirements:

1. Load more than 50 kg;
2. With handle;
3. Can be fully sealed off.

10.3 Storage

Store the inverter in dry place where temperatures are between -25 °C - +70 °C.

10.4 Disposal

Please deliver inverters and packing materials to a suitable space where should meet disposal regulations for electronic scrap at the end of its service.

11 Technical Data

11.1 Input (DC)

Model	SolarRiver 3400TL-D	SolarRiver 4000TL-D	SolarRiver 4500TL-D	SolarRiver 5000TL-D	SolarRiver 5200TL-D
Max.PV power[W]	3400	4000	4500	5000	5200
Max.DC voltage[V]	550				
Max.input current[A]	10.5/10.5	12/12	13.5/13.5	15/15	15/15
Number of MPP trackers /strings per MPP tracker	2/1				
Max power of Track1/ Track2[W]	2200/2200	2500/2500	2750/2750	3000/3000	3100/3100
MPP voltage range (at rated power)[V]	160~500	165~500	165~500	175~500	175~500
DC Switch	optional				
Shutdown voltge/Start voltage[V]	60/100				

11.2 Output (AC)

Model	SolarRiver 3400TL-D	SolarRiver 4000TL-D	SolarRiver 4500TL-D	SolarRiver 5000TL-D	SolarRiver 5200TL-D
AC nominal power[W]	3000	3680	4000	4600	4600
Max.AC power[W]	3200	3680	4300	4600	5000
Max.AC current[A]	16	16	22	23	24
Nominal AC voltage/ range[V]	230/180~270				
AC grid frequency/ range[Hz]	50/47~52				
Power factor(cosφ)	0.8lagging~0.8leading				
Total harmonic distortion (THDi)(at nominal power)	<3%				

11.3 Efficiency

Model	SolarRiver 3400TL-D	SolarRiver 4000TL-D	SolarRiver 4500TL-D	SolarRiver 5000TL-D	SolarRiver 5200TL-D
Max.efficiency	97.4%	97.6%	97.6%	97.6%	97.6%
Euro efficiency	96.5%	97.1%	97.1%	97.1%	97.1%
MPPT efficiency	99.9%				

11.4 General data

Model	SolarRiver 3400TL-D	SolarRiver 4000TL-D	SolarRiver 4500TL-D	SolarRiver 5000TL-D	SolarRiver 5200TL-D
Dimensions(W/H/D) [mm]	520 / 380/ 175				
Weight [kg]	26				
Operating temperature range [°C]	-20~+60				
Ingress protection	IP65				
Topology	tansformerless				
Internal consumption (night) [W]	<3				
Cooling concept	Convection				
Noise (typical) [dB]	<30				
LCD display	3.5inch TFT LCD				
Communication	Ethernet optional for RS485/GPRS/WiFi				
Standard warranty [year]	5				

12 Guarantees

Samil Power Co., Ltd offers 5 years warranty service for SolarRiver-D inverter. Warranty period is from the date of installation. But the longest period don't exceed 66 months from the date of delivering goods. During the warranty period, Samil Power Co., Ltd guarantees normal function of the SolarRiver-D inverter. If there are faults within our responsibility, we will provide maintenance free of charge. During the warranty period, if inverter appears malfunction or fault, please contact your dealer or installation contractor.

The followings are not included in the scope of warranty:
√ Use SolarRiver-D inverter for other purpose;
√ Install incorrectly or not conform to the rule;
√ Improper operation
√ Useunqualified protection when working;
√ Modify the equipment without authority;
√ Damage because of external factors or the majeure force(such as lightning, over-voltage, bad weather, and fire, earthquake, tsunami and so on);
√ Poor ventilation;
√ Don't comply with the relevant safety regulations;
√ Transportation damage.

Appendix：

Apple	AirPort Express with 802.11n	A1264
	AirPort Extreme Simultaneous dual-band 802.11n	A1301
	AirPort Extreme Simultaneous dual-band 802.11n (Late 2009)	A1354
	Apple	A1143
Corega	CG-WLR300NNH	CG-WLR300NNH
	CG-WLR300NM	CG-WLR300NM
	IEEE802.11b/g/n Wireless Broadband AP/Router	CG-WLR300GNE
Belkin	N Wireless Router	F5D8236-4 v2
	N+ Wireless Router	F5D8235-4 v2
	Enhanced Wireless Router	F6D4230-4 v2
	Belkin N Wireless Router	F5D8236-4 v3000
	N+ Wireless Router	F5D8235-4 v3
	N Wireless Modem Router	F5D8636-4 v2
	Belkin Router	F7D3302 v1
	Belkin Router	F7D4302 v1
	Belkin Router	F7D4301 v1
	Belkin Wireless Modem Router	F7D1401 v1
	Belkin Wireless Modem Router	F7D2401 v1, F7D2401-B v1
	Belkin Modem Router	F7D3402 v1
	Surf Wireless Router	F7D2301
	Share Max Wireless Router	F7D3301
	Surf N300 Wireless N Router	F7D2301 V3000
	Surf N300 Wireless N Router	F7D6301 V3000
	Connect N150 Wireless Router	F7D5301 V3000
	Connect N150 Wireless Router	F7D1301 V3000
Buffalo	BUFFALO Nfiniti Router WHR-HP-G300N	WHR-HP-G300N
	BUFFALO AirStation WHR-HP-GN	WHR-HP-GN
	BUFFALO Nfiniti Router WHR-G301N	WHR-G301N
	BUFFALO Nfiniti Accesspoint WLAE-AG300N	WLAE-AG300N
	BUFFALO Nfiniti Router WZR-HP-AG300H	WZR-HP-AG300H
	BUFFALO Nfiniti Router WZR-HP-G302H	WZR-HP-G302H
	BUFFALO-WZR-AMPG144NH	WZR-AMPG144NH
Cisco Linksys	Wireless-N Gigabit Router	WRT310Nv2
	Wireless-N Home Router	WRT120N
	Wireless-N Access Point with Dual-Band	WAP610N
	Dual-Band Wireless-N Gigabit Router	E2000

	Wireless-N Broadband Router	E1000
	Wireless-N Broadband Router	M10
	Wireless-N Gigabit Router	M20
	Wireless-N Broadband Router	E1000(v2.1)
	Wireless-N Gigabit Router	M20
	Dual-Band Wireless-N Gigabit Router	E2000
	Wireless-N Broadband Router	E1000(v2)
	Wireless-N Broadband Router	M10(v2)
	Linksys	WRT54G v8
	Cisco AIR-AP1231G-A-K9	AIR-AP1231G-A-K9
	Linksys WRT54	WRT54 G2 v1
	Cisco Aironet	Aironet 1200
	Cisco Controller AP	1130G
	Cisco Controller	1242AG
D-Link	IEEE 802.11 b/g/N Wireless Router / DIR-605	DIR-605
	D-Link DIR-615 Wireless N Router	DIR-615E3/E4
	IEEE 802.11 b/g/N Wireless Router /DIR-605.B2	DIR-605.B2
	WIRELESS N 150 HOME ROUTER / DIR-600 V.B4	DIR-600 V.B4
	DIR-815 Wireless N Dual Band Router / DIR-815 v1.00	DIR-815 v1.00
	Wireless N 8 port router	DIR-632
	IEEE 802.11 Wireless N 150 Home Router / DIR-501	DIR-501
	IEEE 802.11 Wireless N Router / DIR-515	DIR-515
	IEEE 802.11a/b/g/n wireless Access Point / DAP-2690	DAP-2690
	IEEE 802.11 b/g Mobile Wireless Router / DIR-412	DIR-412
	Dlink G730AP v2	G730AP v2
IO Data	I-O DATA WN-G54/DCR	WN-G54/DCR
Motorola	Symbol AP-5131	AP5131
NEC	Aterm WR4100N	WR4100N
	NEC PA-WR8170N-HP	PA-WR8170N-HP
	NEC PA-WR8700N-HP	PA-WR8700N-HP
Netgear	Wireless-N 300 Router	JWNR2000
	Wireless-N 150 Router	WNR1000v2
	Wireless-N 300 Router	WNR2000v2
	Wireless-N 150 Router	WNR612v2
	N150 Wireless Router	WNR1000v3
	N150 Wireless Router	WGR614v10
	Powerline AV 200 Wireless-N Extender XAVN2001	XAVN2001
	N300 Wireless Router with USB	WNR2200

	ProSafe Dual Band Wireless-N Access Point	WNDAP350
	ProSafe Wireless-N Access Point	WNAP320
	WGR614 v9	WGR614 v9
Proxim	Orinoco AP-700	Orinoco AP-700
	Proxim ORiNOCO	AP-600
TP-Link	150Mbps Wireless Lite N Router	TL-WR740N
	150Mbps Wireless Lite-N Router	TL-WR741ND
	300Mbps Wireless N Router	TL-WR841N
	TP-LINK Wireless N Access Point	TL-WA901ND
	TP-LINK 300Mbps Wireless N Access Point	TL-WA801ND
Planex	Planex-MZK-MF300N	MZK-MF300N

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